



Creating  
**COASTAL  
STEWARDSHIP**  
*through Science*



# Monitoring Creek Health

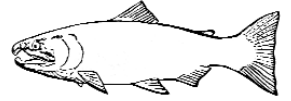
## On-Site Activities

How Healthy Is This Creek? ..... 79

Field Journal Sheets ..... 81

# How Healthy Is This Creek?

Students conduct water quality tests and record observations in their field journals. The Park Ranger leading this visit will also discuss implications between water quality and healthy coho salmon and steelhead trout populations.



## On-site Lesson Plan

**Time required:** 2 – hours

**Location:** Point Reyes National Seashore

**Suggested group size:** limit of 32, discuss with Education Coordinator when making reservations

**Subject(s):** aquatic ecology, chemistry, biology

**Concept(s) covered:** riparian zone, ecology, water quality

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### Student Outcomes

At the end of this activity, the students will be able to:

- Investigate a riparian zone and record results of experiments and observations in their field journals.
- Understand the significance of habitat monitoring through discussion.
- Promote behaviors conducive toward healthy creek habitats in and outside of Point Reyes National Seashore.

### California Science Standard Links (grades 6-8)

This activity is linked to the California Science Standards in the following areas:

- 6th grade: 5e- resources available and abiotic factors;  
7b- appropriate tools and technology to perform tests, collect data, and display data;  
7d- communicate steps and results from an investigation;  
7e- evidence is consistent with a proposed explanation;  
7h- identify changes in natural phenomena over time.
- 7th grade: 7a- appropriate tools and technology to perform tests, collect data, and display data;  
7c- communicate logical connections;  
7e- communicate steps and results from an investigation.
- 8th grade: 1b- average speed is the total distance traveled divided by the total time elapsed.

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## National Science Standard Links (grades 5-8)

This activity is linked to the national science standards in the following areas:

- Content Standard A – Abilities necessary to do scientific inquiry, design and conduct a scientific investigation; use appropriate tools and techniques to gather, analyze, and interpret data; think critically and logically to make the relationships between evidence and explanations.
- Content Standard C – Diversity and adaptation of organisms.
- Content Standard F – Populations, resources, and environments.

### Materials

To be provided by the teacher:

- Constructed field journals, one for each student and chaperone.

### Vocabulary

none

### Procedures

#### 1. Reservations

You must make reservations for this Ranger-led field visit. Locate the reservation form in the “Teachers Preparation” section of Monitoring Creek Health.

#### 2. Expectations

##### **Teacher**

- Make reservations and receive confirmation form.
- Enlist chaperones for a 1:5 adult/student ratio.
- Insure that each chaperone and students have their own field journal for the day of the visit.
- Assume responsibility for discipline issues which may arise and detract from group’s experience.

##### **Chaperones**

- Each chaperone will be responsible for a team of students and for a Creek Monitoring Kit to assist students collecting data.

##### **Ranger**

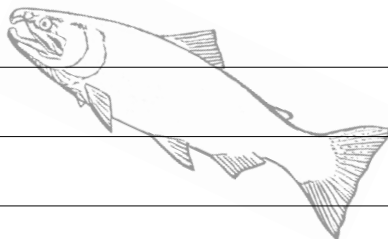
- Facilitate each chaperone-led student group with creek monitoring activities.
- Reserve Creek Monitoring Kits.



## Things to Remember While on Creek Field Trip

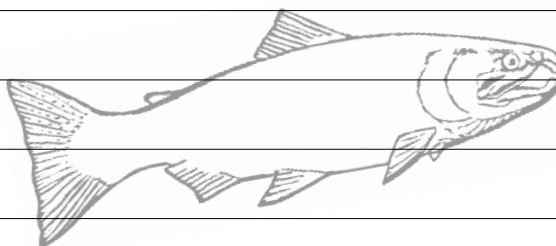
### THREE SAFETY PRECAUTIONS:

1. \_\_\_\_\_  
\_\_\_\_\_
2. \_\_\_\_\_  
\_\_\_\_\_
3. \_\_\_\_\_  
\_\_\_\_\_



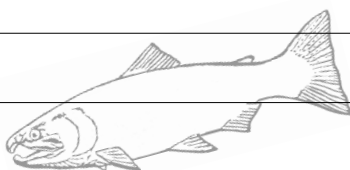
### FOUR RESOURCE PROTECTION BEHAVIORS:

1. \_\_\_\_\_  
\_\_\_\_\_
2. \_\_\_\_\_  
\_\_\_\_\_
3. \_\_\_\_\_  
\_\_\_\_\_
4. \_\_\_\_\_  
\_\_\_\_\_



### THREE THINGS TO KEEP IN MIND WHEN VISITING ANY PART OF THE NATIONAL PARK SYSTEM:

1. \_\_\_\_\_  
\_\_\_\_\_
2. \_\_\_\_\_  
\_\_\_\_\_
3. \_\_\_\_\_  
\_\_\_\_\_





# Field Journal Sheet

## Site Information

Date:	
Other students in your group:	
Location:	State: County: Town:
Name of creek:	
Weather:	<input type="checkbox"/> clear <input type="checkbox"/> cloudy <input type="checkbox"/> rainy
Season:	<input type="checkbox"/> winter <input type="checkbox"/> spring <input type="checkbox"/> summer <input type="checkbox"/> fall
Creek appearance:	<input type="checkbox"/> clear <input type="checkbox"/> oily sheen <input type="checkbox"/> silty <input type="checkbox"/> muddy <input type="checkbox"/> foamy
Animal tracks:  Sketch the tracks you see, or list the animals that created these tracks.	



## Creek Observations

### VEGETATION

Terrestrial:

\_\_\_\_\_ % Trees  
\_\_\_\_\_ % Shrubs  
\_\_\_\_\_ % Plants  
\_\_\_\_\_ % Grasses

Aquatic:

\_\_\_\_\_ % Plants  
\_\_\_\_\_ % Grasses  
\_\_\_\_\_ % Ferns  
\_\_\_\_\_ % Algae

### GEOLOGY

Terrestrial:

☐ sandy  
☐ dirt  
☐ rocky  
☐ boulders

Aquatic:

☐ sand  
☐ small gravel  
☐ large gravel  
☐ boulders

### HUMAN INFLUENCE AND EFFECTS

List one clue that tells you someone was here recently:

\_\_\_\_\_

List one clue that tells you someone was here 50 years ago:

\_\_\_\_\_

Land use in this watershed:

<input type="checkbox"/> buildings	<input type="checkbox"/> recreation
<input type="checkbox"/> logging	<input type="checkbox"/> livestock pasture
<input type="checkbox"/> crops	<input type="checkbox"/> dams
<input type="checkbox"/> fields	<input type="checkbox"/> culverts

### SMELLS AND SOUNDS

Describe three smells and sounds at this location:



## Creek Map

# Field Journal Sheet

Your Rope





# Field Journal Sheet

Tests on Water Samples		
	Creek Edge	Mid-creek
Temperature	Fahrenheit or Celsius	Fahrenheit or Celsius
pH		
Dissolved Oxygen	parts per million	parts per million

Creek Testing			
Channel Width			
Water Depth	right	center	left
Length of Rope (5-10 feet)			
Float Method to Determine Velocity  time to travel distance:	right	center	left





# Field Journal Sheet

## Aquatic Insect Survey

<i>Tolerate Pollution</i>	<i>Tolerate Some Pollution</i>	<i>Do not Tolerate Pollution</i>
<input type="checkbox"/> Aquatic worms	<input type="checkbox"/> Amphipod/scud	<input type="checkbox"/> Alderfly adult
<input type="checkbox"/> Black fly adult	<input type="checkbox"/> Backswimmer	<input type="checkbox"/> Alderfly nymph
<input type="checkbox"/> Black fly larvae	<input type="checkbox"/> Crane fly adult	<input type="checkbox"/> Caddisfly adult
<input type="checkbox"/> Leeches	<input type="checkbox"/> Crane fly nymph	<input type="checkbox"/> Caddisfly larvae
<input type="checkbox"/> Midge larvae	<input type="checkbox"/> Damselfly adult	<input type="checkbox"/> Gilled snails
<input type="checkbox"/> Mosquito adult	<input type="checkbox"/> Damselfly larvae	<input type="checkbox"/> Hellgrammite
<input type="checkbox"/> Mosquito larvae	<input type="checkbox"/> Dragonfly adult	<input type="checkbox"/> Mayfly nymph
<input type="checkbox"/> Pouch snails	<input type="checkbox"/> Dragonfly adult	<input type="checkbox"/> Riffle beetle adult
<input type="checkbox"/> Watersnail eggs	<input type="checkbox"/> Dragonfly larvae	<input type="checkbox"/> Stonefly adult
	<input type="checkbox"/> Water beetle adult	<input type="checkbox"/> Stonefly nymph
	<input type="checkbox"/> Water beetle larvae	<input type="checkbox"/> Water penny larvae
	<input type="checkbox"/> Water strider	
	<input type="checkbox"/> Waterboatman	
<b>Summary</b>		
How many insects did you find that <b>TOLERATE</b> pollution?	How many insects did you find that <b>TOLERATE SOME</b> pollution?	How many insects did you find that <b>DO NOT TOLERATE</b> pollution?



## Field Journal Summary

### TEMPERATURE (C)

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

Record your temperature readings on the line above. Higher temperatures will decrease the amount of dissolved oxygen available to aquatic organisms and decrease the rate of photosynthesis by aquatic vegetation. Salmon need cool water in the 10–13 degree Celsius range (50–57 degree Fahrenheit).

### pH

1 2 3 4 5 6 7 8 9 10 11 12 13 14

Record your pH readings on the line above. A pH ratings of 6 and below or 9 and above is a “poor” rating because it limits life in most streams. A pH rating of 6–8 would be an “excellent” rating because most life forms survive best in neutral conditions.

### DISSOLVED OXYGEN

1 2 3 4 5 6 7 8

5–6 parts per million: required for most fish  
Below 3 parts per million: stressful to most aquatic organisms  
Below 2 parts per million: fatal to most species  
Below 1 part per million: will not support fish

### AQUATIC INSECT SURVEY

In which category did you find the most aquatic insects?

- ☐ those that tolerate pollution.
- ☐ those that tolerate some pollution.
- ☐ those that do not tolerate pollution.

Healthy streams with high water quality will contain many different kinds of aquatic insects and more pollution sensitive types.